UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
CHEMICAL SAFETY AND
POLLUTION PREVENTION

MEMORANDUM:

To: Rita Kumar

From: Jennifer Urbanski, Ph.D. 4/3/13

Date: 4/3/13

Subject: PRODUCT PERFORMANCE DATA EVALUATION RECORD

DP barcode: 408389
Decision no.: 473428
Submission no: 928519
Action code: R340
Product Name: Vikane
EPA Reg. No or File Symbol: 62719-4
Formulation Type: fumigant
Ingredients statement from the label with PC codes included: sulfuryl fluoride (99.8%)
Application rate(s) of product and each active ingredient: depends on pest; 1.9X for bed bugs

I. Action Requested: Review efficacy data to support the change in application rate for bed bugs from 3X to 1.9X

II. Background: A study was provided to present evidence to support a change in application rate for bed bugs from 3X to 1.9X. The protocol used was reviewed and approved by the Agency (DP392802), although the Agency review noted that a study under field conditions would be preferred.

III. MRID Summary:

49011501. Phillips, T. (2012) Evaluation of Sulfuryl Fluoride for Control of Bed Bugs, Cimex lectularius. Project Number: MA11G1A001/OCR. Unpublished study prepared by Kansas State University. 138 p.
(1) GLP or non-GLP? Non-GLP
(2) State the purpose and briefly summarize the methods and results: Two sets of trials were conducted. The first was a dose response trial and the second one was a confirmatory trial to determine the accumulated dose (g-h/m^3) for actual field use. The dose response trial exposed only bed bug eggs (48-96 h old) while the confirmatory trial exposed eggs, nymphs, and adults. In each trial, tests were run at both 15°C and 25°C in airtight, ~3.8L containers. A known number of eggs, nymphs, or adults were placed in 3-gram glass shell vials that were closed with a fine netted cloth to allow fumigant entry without preventing bed bug escape. The vials were then wrapped in mattress pad bedding material to simulate a natural habitat. The accumulated target doses for the confirmatory trial were 1.5X of the 99% lethal accumulated doses (LAD_{99}) from the dose response trial. Evaluations were made daily, beginning at 24 or 48 hrs post treatment . For the confirmatory trials, evaluations were 7 days after fumigation at 25°C, but at 15°C since all fumigated adults and nymphs were dead at 72 hrs, only eggs and emerged nymphs were evaluated up to 9 days post fumigation. At 25°C, the calculated LAD_{99} was 69.1 g-h/m^3. Based on this data the target dose for the 25°C confirmatory trial was 1.5 X LAD_{99} (103.7 g-h/m^3). However in the 25°C confirmatory trial, nymphs emerged and survived from 2 of 439 eggs treated with dosages only 6-7 g-h/m^3 less than the target dose of 103.7 g-h/m^3.

Therefore, it was determined that the threshold dosage for complete egg control (97.9 g-h/m^3) should be used to calculate the monitored field dosage rate of 146.9 g-h/m^3 (1.5 X 97.9 g-h/m^3). At 15°C, the calculated LAD_{99} was 149.8 g-h/m^3. Based on this data the target dose for the 15°C confirmatory trial would have been 1.5 X LAD_{99} (1/5 X 149.8 g-h/m^3 = 224.7 g-h/m^3). However, based on the results from the confirmatory trial at 25°C, 1.5 X the threshold dosage for complete egg control (189.7 g-h/m^3) was used to calculate a target dose of 285 g-h/m^3 (1.5 X 189.7 = 284.55) for the confirmatory test; this rate resulted in 100% mortality for all stages. Control data gave acceptable results for all experiements.

(3) State conclusions as they relate to study results following your review of the primary efficacy review and the study materials: Based on study results, the bed bug dosages for monitored fumigation were 146.8 and 285 g-h/m^3 at 25 and 15 degrees, respectively, which is 1.9X the drywood termite dose. Therefore, the data support a 1.9X rate for the control of bed bugs.

Is the MRID acceptable or not? Acceptable

IV. RECOMMENDATIONS:

The label does not include any specific claims against bed bugs to evaluate. The proposed rate of 1.9X is acceptable based on the laboratory study provided.